

REMARKS

By this Amendment the specification has been amended to include standard topic headings, claim 1 has been replaced by a new claim 19, claims 2-18 have been amended, and new claim 20 has been added to retain a preferred range deleted from claim 3. Entry is requested.

In the outstanding Office Action the examiner has rejected claims 1-18 under 35 U.S.C. 103(a) as being unpatentable over Holcomb et al. in view of Hauge.

The applicant asserts that this rejection is without merit.

In the present invention, there is a phosphoric acid attack of phosphate ore. This attack (or etching) is carried out in such a manner that TSP is obtained. Such an attack is very well-known and corresponds to the following reactions:



rock acid (WPPA) TSP



A ratio  $\frac{\text{P}_2\text{O}_5 \text{ acid}}{\text{P}_2\text{O}_5 \text{ rock}}$  = 2 is obtained.

This ratio is confirmed in Example 1. The starting material is 100 g of phosphate rock having a P<sub>2</sub>O<sub>5</sub> content of 28-30%, i.e., about 33 g of P<sub>2</sub>O<sub>5</sub>, and 190 g of H<sub>3</sub>PO<sub>4</sub> having a P<sub>2</sub>O<sub>5</sub> content of 30-40%, i.e., about 65 g of P<sub>2</sub>O<sub>5</sub>.

After the steps of dissolving the obtained paste in water and subsequent liquid/solid separation, the method according to the invention provides a step of displacing the calcium ions in the liquid phase by ions of a strong base in order to obtain as final products, on the one hand, a precipitate of DCP, and on the other hand, the desired product, a solution of a phosphate of sodium, potassium or ammonium.

Holcomb et al. disclose a method for preparing monocalcium phosphate and/or phosphoric acid from phosphate rock.

Firstly, this method comprises a step of acidulating phosphate rock with an excess of phosphoric acid in the presence of silicon dioxide. This excess corresponds to a ratio P<sub>2</sub>O<sub>5</sub> acid/P<sub>2</sub>O<sub>5</sub> rock of 6/1 to 15/1 (see col. 7, lines 15 to 34). In these conditions, the obtained product is not TSP as in the present invention. The liquid phase resulting from the separation of the mixture resulting from the phosphoric attack in Holcomb et al. contain soluble MCP, phosphoric acid and soluble calcium fluosilicates. After separation, removing of fluorides and silica is necessary.

An embodiment consists of adding to the separated solution an alkali metal salt in order to precipitate fluosilicate and silica and recover a solution of MCP in phosphoric acid (see col. 8, lines 17 to 37).

According to another embodiment, the separated solution is cooled in presence of an alkali metal salt, with precipitation of a mixture of a portion of MCP and of alkali metal fluosilicate and formation of a solution of MCP/H<sub>3</sub>PO<sub>4</sub> (see col. 8, lines 38 to 53).

In none of these embodiments is there a displacement of the calcium ions in the separated solution by ions of a strong base which results in formation of an aqueous solution of phosphate(s) of said strong base (for example of soluble phosphate of sodium) and of a precipitate of a water-insoluble calcium phosphate (which is DCP according to the invention). The alkali metal salt is used only for reacting with the introduced silica and with the fluoride present in the rock in order to produce insoluble alkali metal fluosilicates (see col. 10, lines 55 to 60).

Hauge discloses a very complicated method for extracting phosphorus compounds from phosphate ores. This method provides an attack by a mineral acid which is dilute hydrochloric or nitric acid (see col. 3, lines 52 to 54 and claims 2 and 3). A stronger acid may further be used, and in this case sulfuric acid is used (see for example col. 5, line 13). Such an attack does not allow production of TSP. During the process, milk of lime, i.e.,  $\text{Ca}(\text{OH})_2$ , may be added in order to precipitate an insoluble phosphate of calcium (DCP) and to obtain an aqueous solution of calcium chloride when the attack is chlorhydric (see for example, col. 6, lines 48 to 68).

It is impossible to deduce from the teaching of Hauge the production of an aqueous solution of a strong base phosphate from TSP.

A person of ordinary skill, having read Holcomb et al., would not be prompted to add, as indicated in Hauge, milk of lime in the aqueous solution resulting from the separation of the phosphoric acid attack (see

Office Action, p. 4, lines 7-17). Effectively, such an addition would result in precipitating all the phosphate values under the form of DCP. It would even be possible that no more MCP and phosphoric acid subsists in the aqueous phase what is in complete contradiction of the objective of Holcomb et al.

In any case, a person of ordinary skill would not be prompted to use the teaching of either Holcomb et al., or Hauge for preparing a solution of a water-soluble strong base phosphate since in neither of these prior documents is such a phosphate obtained or suggested.

The examiner's prior art rejection should be withdrawn and the presented claims allowed.

Respectfully submitted,

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